6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

[EPA-HQ-OW-2009-0921; **FRL-9810-4]**

FINAL AQUATIC LIFE AMBIENT WATER QUALITY CRITERIA FOR AMMONIA – FRESHWATER 2013

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of availability of final criteria.

SUMMARY: Pursuant to section 304(a) of the Clean Water Act (CWA), the Environmental Protection Agency (EPA) is announcing the availability of final national recommended ambient water quality criteria for the protection of aquatic life from effects of ammonia in freshwater (EPA 822-R-13-001). The final criteria incorporate the latest scientific knowledge on the toxicity of ammonia to freshwater aquatic life. On December 30, 2009, EPA published draft national recommended water quality criteria for ammonia and provided the public an opportunity to provide scientific views. Aquatic life criteria are developed based on EPA's *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses (1985), (EPA/R-85-100)*. EPA's recommended section 304(a) water quality criteria provide guidance to States and authorized Tribes in adopting water quality standards for protecting aquatic life and human health. EPA's recommended water quality criteria by themselves have no binding legal effect. These national recommended criteria for ammonia in freshwater are intended to protect aquatic life and do not address human health toxicity data. The water quality criteria for ammonia for the protection of saltwater organisms are not being updated at this time. EPA's national recommended final acute ambient water quality criteria (AWQC) for protecting freshwater organisms from potential effects of ammonia is 17 mg/L total

ammonia nitrogen (TAN) and the final chronic AWQC for ammonia is 1.9 mg/L TAN at pH 7.0 and temperature 20° C.

ADDRESSES: Scientific views received from the public on the draft ammonia criteria documents are available from the EPA Docket Center and are identified by Docket ID No. EPA-HQ-OW-2009-0921. They may be accessed online at:

- www.regulations.gov: Follow the on-line instructions.
- Email: OW-Docket@epa.gov
- Mail: US Environmental Protection Agency; EPA Docket Center (EPA/DC) Water Docket, MC 2822T; 1200 Pennsylvania Avenue, NW, Washington, DC 20460.
- On Site: EPA Docket Center, 1301 Constitution Ave, NW, EPA West, Room 3334, Washington DC. This Docket Facility is open from 8:30 am until 4:30 pm, EST, Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Office of Water is (202) 566-2426.

For additional information about EPA's public docket visit the EPA Docket Center homepage at http://www.epa.gov/epahome/dockets.htm.

FOR FURTHER INFORMATION CONTACT:

Lisa Huff, Health and Ecological Criteria Division (4304T), U.S. EPA, 1200 Pennsylvania Ave., NW., Washington, DC 20460; (202) 566–0787; huff.lisa@epa.gov.

SUPPLEMENTARY INFORMATION:

I. What are Water Quality Criteria?

Water quality criteria are either narrative descriptions of water quality or scientifically derived numeric values that protect aquatic life or human health from the deleterious effects of pollutants in ambient water.

Section 304(a)(1) of the Clean Water Act (CWA) requires EPA to develop and publish and, from time to time, revise, criteria for protection of water quality and human health that accurately reflect the latest scientific knowledge. Water quality criteria developed under section 304(a) are based solely on data and scientific judgments on the relationship between pollutant concentrations and environmental and human health effects. Section 304(a) criteria do not reflect consideration of economic impacts or the technological feasibility of meeting pollutant concentrations in ambient water.

Section 304(a) criteria provide guidance to States and authorized Tribes in adopting water quality standards that ultimately provide a basis for assessing water body health and controlling discharges or releases of pollutants. Under the CWA and its implementing regulations, States and authorized Tribes are to adopt water quality criteria to protect designated uses (e.g., public water supply, aquatic life, recreational use, or industrial use). EPA's recommended water quality criteria do not substitute for the CWA or regulations, nor are they regulations themselves. Thus, EPA's recommended criteria do not impose legally binding requirements. States and authorized Tribes have the discretion to adopt, where appropriate, other scientifically defensible water quality criteria that differ from these recommendations.

II. What is Ammonia and Why is EPA Concerned About It?

Ammonia is a constituent of nitrogen pollution. Unlike other forms of nitrogen, which can cause eutrophication of a water body at elevated concentrations, the primary concern with ammonia is its direct toxic effects on aquatic life, which are exacerbated by elevated pH and temperature. Ammonia is considered one of the most important pollutants in the aquatic environment not only because of its highly toxic nature and occurrence in surface water systems, but also because many effluents have to be treated in order to keep the concentrations of ammonia in surface waters from being unacceptably high. Ammonia can enter the aquatic environment via direct means such as municipal effluent discharges and the excretion of nitrogenous wastes from animals, and indirect means such as nitrogen fixation, air deposition, and runoff from agricultural lands.

III. What are the 2013 Ammonia Criteria Recommendations?

EPA is today publishing final national recommended ambient water quality criteria for protecting freshwater aquatic life for ammonia. These final criteria updates are based on EPA's *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* (1985), (EPA/R-85-100). These Guidelines describe the Agency's current approach for deriving national recommended water quality criteria to protect aquatic life. The latest toxicity data and other information on the effects of ammonia on freshwater aquatic life were obtained from reliable sources and subjected to both internal and external scientific peer review. The national

recommended water quality criteria for ammonia in saltwater are not being updated at this time.

The available data for ammonia, evaluated in accordance with EPA's *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* (1985), indicate that freshwater aquatic animals would have an appropriate level of protection if the following are attained:

Freshwater: Freshwater aquatic organisms and their uses should not be affected unacceptably if –

1. The one-hour average concentration of total ammonia nitrogen (in mg TAN/L) does not exceed, more than once every three years on the average, the criterion maximum concentration (i.e., the "CMC," or "acute criterion").

2A. The thirty-day average concentration of total ammonia nitrogen (in mg TAN/L) does not exceed, more than once every three years on the average, the criterion continuous concentration (i.e., the "CCC," or "chronic criterion").

2B. In addition, the highest four-day average within the 30-day period should not exceed 2.5 times the CCC, more than once every three years on the average.

The acute and chronic criteria concentrations are expressed as functions of temperature and pH, such that values differ across sites, and differ over time within a site. The criteria document describes the relationship between ammonia and these water quality factors and provides tables showing how the criteria value changes with varying pH and temperatures. As temperature decreases, freshwater invertebrates, but not fish, become

less sensitive to ammonia, and below a particular temperature threshold (i.e., 15.7°C for the CMC and 7°C for the CCC), fish become more sensitive than invertebrates.

Acute Criteria: At pH 7, the CMC ranges from 7.3 mg TAN/L at 30°C to 24 mg TAN/L at 0°C.

Chronic Criteria: At pH 7, the CCC ranges from 0.99 mg TAN/L at 30°C to 4.4 mg TAN/L at 0°C.

2013 Final ALC Criteria for Ammonia (Magnitude, Frequency, and Duration) (mg TAN/L) pH 7.0, T=20°C	
Acute (1-hour average)	17
Chronic (30-day rolling average)	1.9*
*Not to exceed 2.5 times the CCC as a 4-day average within the 30-days, i.e. 4.8 mg TAN/L at pH 7 and 20°C more than once in 3 years on average.	
Criteria frequency: Not to be exceeded more than once in 3 years on average.	

Note: These criteria values are appropriate at the standard normalized pH and temperature of pH 7.0, a temperature of 20°C; ammonia criteria are a function pH and temperature.

IV. What New Data Have Been Included in the 2013 Ammonia Criteria Recommendations?

Since the publication of the 1999 Update of Ambient Water Quality Criteria for Ammonia (EPA-822-R-99-014)**,** numerous new scientific studies were published indicating that freshwater mussels are more sensitive to ammonia than the organisms represented in the 1999 criteria dataset, and that snails, another freshwater mollusk group, are also sensitive to ammonia. EPA evaluated the new toxicity data per EPA's 1985 Guidelines for deriving aquatic life criteria (Stephan et al., 1985) and incorporated the acceptable data in calculating the final criteria for ammonia. The final recommended acute and chronic criteria for ammonia presented in this document are protective of the aquatic community, including freshwater mollusks.

V. What is the Relationship Between the Ammonia Criteria Recommendations and State or Tribal Water Quality Criteria?

Water quality standards consist of three principal elements: designated uses, water quality criteria to protect those uses, and antidegradation requirements, providing for protection of existing water uses and limitations on degradation of high quality waters. As part of the water quality standards triennial review process defined in Section 303(c)(1) of the CWA, the States and authorized Tribes are responsible for developing, maintaining and revising water quality standards. Section 303(c)(1) requires States and authorized Tribes to review and modify, if appropriate, their water quality standards at least once every three years.

States and authorized Tribes must adopt water quality criteria into their water quality standards that protect designated uses. States may develop their criteria based on EPA's recommended section 304(a) water quality criteria or other scientifically defensible methods. A state's criteria must contain sufficient parameters or constituents to protect the designated uses. Consistent with 40 CFR 131.21, new or revised water quality criteria adopted into law by States and authorized Tribes on or after May 30, 2000 are in effect for CWA purposes only after EPA approval.

States and authorized Tribes may also develop site-specific criteria for particular waterbodies as appropriate, following EPA procedures described in the *Guidelines for Deriving Numerical Aquatic Site-Specific Water Quality Criteria by Modifying National Criteria* (USEPA, 1984f). A site-specific criterion is intended to come closer than the national criterion to providing the intended level of protection to the aquatic life at that particular site, usually by taking into account the biological and/or chemical conditions (i.e., the species composition and/or water quality characteristics) at that site. If data in the national criterion document and/or from other sources indicated that the site's resident species range of sensitivity is *different* from that for the species in the national criterion document, States and authorized Tribes can develop site-specific criteria following the *Revised Deletion Process for the Site-Specific Recalculation Procedure for Aquatic Life Criteria* (EPA 823-R-13-001). For example, if freshwater mussel species are not resident at a site, the *Revised Deletion Process for the Site-Specific Recalculation Procedure for Aquatic Life Criteria* might be used to recalculate the criteria without these species.

VI. Where Can I Find More Information About Water Quality Criteria and Water Quality Standards?

The EPA has developed supporting documents to aid states considering adoption of the 2013 recommended ammonia criteria. *Flexibilities for States Applying EPA's Ammonia Criteria Recommendations* (EPA 800-F-13-001) provides an overview of a number of flexibilities available for state consideration, including the *Revised Deletion Process for the Site-Specific Recalculation Procedure for Aquatic Life Criteria* mentioned above, variances, revisions to designated uses, dilution allowances, and compliance schedules. The document describes how each of these flexibilities fits within a state's water quality standards adoption and implementation process.

For more information about water quality criteria and water quality standards refer to the following: *Water Quality Standards Handbook* (EPA 823-B94-005a); *Advanced Notice of Proposed Rule Making (ANPRM)*, (63FR36742); *Water Quality Criteria and Standards Plan -- Priorities for the Future* (EPA 822-R-98-003); *Guidelines and Methodologies Used in the Preparation of Health Effects Assessment Chapters of the Consent Decree Water Criteria Documents* (45FR79347); *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health* (2000), EPA-822-B-00-004); *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* (EPA 822/R-85-100); *National Strategy for the Development of Regional Nutrient Criteria* (EPA 822-R-98-002); and *EPA Review and Approval of State and Tribal Water Quality Standards* (65FR24641).

You can find these publications through EPA's National Service Center for Environmental Publications (NSCEP, previously NCEPI) or on the Office of Science and Technology's Home-page (http://www.epa.gov/waterscience).

Dated: April 30, 2013.

Nancy K. Stoner,

Acting Assistant Administrator, Office of Water.

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